ADI 41 (2020-2021): 171-192

COPYRIGHT PROTECTION OF WORKS GENERATED BY ARTIFICIAL INTELLIGENCE IN THE EUROPEAN COPYRIGHT LAW: BETWEEN INDIRECT AND TAILORED PROTECTION

LA PROTECCIÓN DE OBRAS GENERADAS POR LA INTELIGENCIA ARTIFICIAL EN EL DERECHO DE AUTOR EUROPEO: ENTRE LA PROTECCIÓN INDIRECTA Y A MEDIDA

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ABSTRACT

Amid the 4th Industrial Revolution, Artificial Intelligence (AI) systems are developing to a point where they will cease to be solely a tool for human beings. We are witnessing, every day, the emergence of more and more works that do not have any human intervention, and it is estimated that before long, the primary cultural source of new works may move from the human to the machine. The purpose of this study is to frame the current debate on the intellectual protection of works generated by AI systems and how to understand the legal options for their protection by copyright or related rights.

Keywords: artificial intelligence, copyright, works.

RESUMEN

En plena 4.ª Revolución Industrial los sistemas de Inteligencia Artificial (IA) se están desarrollando a un punto en que dejarán, únicamente, de ser una herramienta para el ser humano. Estamos asistiendo, todos los días, al surgimiento de cada vez más obras que no tienen cualquier intervención humana y se estima que dentro de poco tiempo la principal fuente cultural de nuevas obras pueda moverse del ser humano para la máquina. El propósito del presente estudio es encuadrar el debate actual sobre la protección intelectual de las obras generadas por sistemas de IA bien cómo entender las opciones legales para su protección por derechos de autor y/o derechos conexos.

Palabras clave: inteligencia artificial, derechos de autor, obras.

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Fecha de recepción: 19 de abril de 2021 // Fecha de aceptación: 14 de mayo de 2021.

I. INTRODUCTION

The impact of artificial intelligence (AI) on the various branches of law is not yet wholly understood[1]. Though no one doubts how it will ultimately exercise an influence on each legal field. We must not forget that law and technology are different, from the very outset, in the pace of their respective development. Technology evolves in a bewildering way and usually operates at the limits of regulation. In contrast, apart from being a historical and cultural product of humankind, the law works typically with known models, and, therefore, its evolution is slower and more orderly. In any case, it will be up to jurists, in a hermeneutic effort, to legally frame these new realities.

The effect of AI on intellectual property (IP) law is no exception. As the technology used in AI becomes more sophisticated during Revolution 4.0, this issue takes on another dimension. The lack of consensus on AI's definition[2] does not prevent us from characterising it in a simple way for the purpose of this study: AI is a branch of computer engineering that aims to replicate the human brain's neural capacities. The possibility of generating works is one of those capacities. As AI advances further, this implies that, eventually, little or no human input at all is involved in creating these works[3]. In this sense, AI systems are not only assisting human beings but are already capable of automatically generating literary or artistic works. The *New Rembrandt*[4] portrait below is an example:

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[1] Towards a perspective on image rights, cfr. FIDALGO (2018), p. 879.

[2] Although the idea of artificial intelligence goes back further [cfr. TURNER (2019), pp. 4 et seq.], the contemporary concept of AI seems to have been coined at Dartmouth College, New Hampshire, in 1956, during a summer workshop that was the seminal event in this information technology field. There have always been scientists fascinated with understanding the human brain. However, only when simplistic theories advocating those sensory perceptions drive the human thought process had been abandoned was it possible to move forward in this field. Two trends were established at the Dartmouth meeting: one involved teaching machines to understand and analyse human languages; another focused its efforts on developing expert systems by sector, as we have already, for example, in the legal field [*vid*., for example, GERVAIS (1991), pp. 628, 630 et seq.]. Nevertheless, the definition of AI remains a complex issue to explain, especially concerning the term «intelligence» [on this topic, *vid*. TURNER (2019), pp. 7 et seq. and FERNÁNDEZ CARBALLO-CALERO (2021), pp. 21 et seq.].

[3] *Vid*. GUADAMUZ (2017a), who states: «Creating works using artificial intelligence could have very important implications for copyright law. Traditionally, the ownership of copyright in computer-generated works was not in question because the program was merely a tool that supported the creative process, very much like a pen and paper (...). But with the latest types of artificial intelligence, the computer program is no longer a tool; it actually makes many of the decisions involved in the creative process without human intervention».

[4] *Vid*. *https://www.nextrembrandt.com/*.

The portrait consists of a painting generated by 3D printing technology developed by an algorithm that analysed hundreds of paintings by the famous painter Rembrandt in a process lasting 18 months. It is based on nearly 170,000 fragments of the Dutch painter's works stored in a specially designed database. The aim was to produce a painting that came as close as possible to the actual paintings by Rembrandt. Other examples include Google's DeepMind[5] music compositions, a novel written by AI software[6], or *The First Thinking Sculpture* inspired by Gaudi[7]. Similar examples are increasingly available[8]. AI may soon be the primary source of culture.

This issue has drawn the attention of several policymakers. In September 2019, the World Intellectual Property Organization (WIPO) organized a debate on IP and AI, launching a public consultation on AI's issues with respect to intellectual property. One of the points mentioned was, justly, authorship and ownership over works created by AI systems[9]. Likewise, the European Parliament (EP) adopted 20 October 2020 a Resolution (2020/2015(INI)) on intellectual property rights for the development of AI technologies[10]. This resolution follows another EP Report from 2017[11], which, addressing civil law and robotics issues in more general terms, also discussed the problem of intellectual creations produced «by computers or robots».

In view of the above, we need to ask whether these works should be protected by copyright. This topic is not at all new. It echoes the problems of protecting *computer-generated works*, which surfaced with the advent of the third industrial revolution. Apart from scholars[12] who have been discussing this issue for some time, as early as 1965, the United States Copyright Office had al-

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[5] *Vid*. *https://deepmind.com/*.

[6] *Vid*. *https://www.digitaltrends.com/cool-tech/japanese-ai-writes-novel-passes-first-round-nationanl-literary-prize/*.

[7] *Vid*. *https://www.ibm.com/blogs/internet-of-things/first-thinking-sculpture/*.

[8] *Vid*. Fernández Carballo-Calero (2021), pp. 44 et seq.

[9] Cfr. WIPO, *WIPO Conversation on Intellectual Property (IP) and Artificial Intelligence (AI)*, Draft Issues Paper on Intellectual *Property and Artificial Intelligence*, Second Session, WIPO Secretariat, available at: *https://www.wipo.int/edocs/mdocs/mdocs/en/wipo_ip_ai_2_ge_20/wipo_ip_ai_2_ge_20_1.pdf* (accessed 10 January 2020), pp. 4 and 5.

[10] *Vid*. European Parliament, *Resolution on intellectual property rights for the development of artificial intelligence technologies* (2020/2015(INI)), 20.10.20, available at: *https://www.europarl.europa.eu/doceo/document/TA-9-2020-0277_EN.html* (accessed 11 February 2021).

[11] *Vid*. European Parliament, *Report with recommendations to the Commission on Civil Law Rules on Robotics (2015/2103(INL))*, Committee on Legal Affairs, 27.01.2017, 28, available at: *https://www.europarl.europa.eu/doceo/document/A-8-2017-0005_EN.html* (accessed 11 February 2021).

[12] Cfr., for example, Fromm (1964), p. 304; Samuelson (1986), p. 1185.

ready received a filing that requested copyright protection for works that were, at least partly, generated by a computer[13]. At that time, there was a transition from mechanical and analogue to digital electronic technology and it assumed significant proportions with the massive dissemination of personal computers (so-called pc's) in the eighties and software development, all of which allowed for multiple tasks to be performed and works produced where any human contribution was greatly reduced.

If we look at the legal rules on copyright in the various European legal systems, we can conclude that most of them do not seem to have been conceived for this reality, even considering that the degree of creativity of works today is relatively undemanding. However, we cannot ignore that there are already some jurisdictions, such as the United Kingdom (UK), which deal with the so-called «*computer-generated works*». Therefore, it behoves us to determine if this solution may be applied to countries with a *droit d'auteur* tradition, like Portugal, France, or Germany and, finally, whether it is likely to fit into the current European Union copyright legal framework. If such a solution is not possible, it will be necessary to examine whether the copyright regimes currently in place can somehow —indirectly— protect this type of works or if the solution should be found in a specific regime.

Thus, with this article, we intend to examine how works generated by AI can be framed under the present copyright rules and also discuss possible alternative ways to cope with the problem. Our approach considers, mainly, a European Union perspective. For this purpose, after this brief introduction, we start our analysis by considering the protection of *computer-generated works* in the UK (II), continuing by explaining the human-centred concept of originality in the European Copyright Law (III). We follow by analysising the protection AI works by the related right of producers of sound recordings (IV). In the next section (V), we will analyse the eventual *sui-generis* protection for AI works, followed by refusing an *e-authorship/ownership* (VI). In our conclusions (VII), we sum up the main ideas in this article and clarify our position.

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[13] *Vid*. Copyright Office, *Sixty-Eighth Annual Report of the Register of Copyrights for the Fiscal Year Ending June 30*, Washington, 1966, 4.

In the Annual Report of The Register of Copyrights of The United States some concerns were pointed out about the Registration of works generated by computer. In 1964 the Copyright Office allowed the protection of computer programs, and some applications for registration were made in this respect. And curiously one of them involved the registration of an abstract design that was partly computer-generated. This raised some doubts expressed in the report itself, namely whether the human is the author and the computer is a mere assistant, or conversely whether the computer could be framed in the notion of authorship [*vid*. Denicola (2016) pp. 251 and 266; Abbott (2016), p. 1101; Samuelson (1986), pp. 1193 et seq.].

These issues were raised again ten years later by the Commission on New Technological Uses of Copyrighted Works (CONTU), which issued a final report in 1978 that treated computers as only an assistant and not as gifted with intelligence capable of printing expressive elements out of the reach of its users and programmers. (National Commission on New Technological Uses of Copyrighted Works (CONTU), *Final Report*, Chapter 3, Computers and Copyright, 1978, 48). It should be mentioned that this report did not have the prescience to foresee the rise of AI in the near future, considering that the user of the program would be the author of the work generated by a computer. This disregard for computer-generated works was later criticized by the Office of Technology Assessment (OTA) (Office of Technology Assessment, *Intellectual Property Rights in an Age of Electronics and Information*, OTA-CIT-302, US. Congress, 1986, 72), due to the conclusions of the CONTU not having taken into account a more automated near future, where computer programs are not just a tool like a camcorder incapable of expressive creation (U.S. Congress, Office of Technology Assessment, cit., 72). Despite this, there was no conclusive answer on who should be considered the author of the work generated by a computer [*vid*. Bridy (2012), p. 23].

II. THE PROTECTION OF COMPUTER-GENERATED WORKS IN THE UK

In addressing the present controversy, we must necessarily turn to the UK's protection regime for computer-generated works. Before the 1988 Copyright, Designs, and Patents Act (CDPA), there were many doubts about how eventually protect and define the ownership of computer-generated works. These doubts were resolved by Section 9(3) of the CDPA, which confers protection for computer-generated works with no human contribution. This provision states the following:

> «In the case of a literary, dramatic, musical or artistic work which is computer-generated, the author shall be taken to be the person by whom the arrangements necessary for the creation of the work are undertaken».

The wording of the provision presents a relevant limitation: it specifically applies only to literary, dramatic, musical, and artistic works and snubs other types of works such as computer programs or databases generated by computers[14].

Section 178 of the CDPA defines a computer-generated work. It states:

> «"computer-generated", in relation to a work, means that the work is generated by computer in circumstances such that there is no human author of the work».

The article's straightforward and concise wording motivated some authors[15] to frame the new reality of works brought about by AI agents in this provision. Guadamuz argues that «the idea behind such a provision is to create an exception to all human authorship requirements by recognizing the work that goes into creating a program capable of generating works, even if the creative spark is undertaken by the machine»[16]. Turner argues that the provision sets up a *two-stage analysis*, that is, «the first stage is to identify whether there is a human author. If a human author cannot be found, the second stage is to identify the person by whom the arrangements necessary for the creation of the work are undertaken»[17]. Although we have our doubts as to whether this legal regime has been crafted to deal with these new challenges posed by AI —or only to solve a problem of originality where the intervention of the computer is such that it is difficult to identify the human contribution—, we might agree that this provision has enough room to cover AI works[18].

> We should, however, highlight the fact that the definition of the expression «computer-generated works» is often used differently, departing from the concept

[14] Bentley / Sherman (2009), p. 107.
[15] Guadamuz (2017b), pp. 169 and 175.
[16] Guadamuz (2017a).
[17] Turner (2019), p. 125.
[18] It should be noted that this legal regime was created in 1988 where copyright problems were less complex than now. As William Cornish states: «the CPDA 1988 introduced the «computer-generated work» - a work produced «in circumstances such that there is no human author. Dazzled by ideas that computer-aided design and computer-aided manufacture (CAD/CAM) were lighting a road towards industrial and informational productions from the «intelligence» of computers, Parliament felt that this precautionary intervention was needed» [Cornish / Llewelyn / Aplin (2010), p. 880].

set out in the UK CDPA 1988. Some authors propose a two-fold classification[19], others a tripartite one[20]. For example, Gervais discusses three categories: (i) a computer as a mechanical tool (for example, a word processor); (ii) a computer as an assistant in the process of creation (for example, helping to create musical melodies); and (iii) a computer as a creator. In this last classification, the author separates cases where the computer merely chooses between predefined alternatives and cases where the computer, through its own functions, generates a novel work, one that was not anticipated by the creator of the software[21]. Although we assume that sometimes the boundaries between these three categories are grey, only this third case shall be taken into account for the purposes of our discussion.

Considering that there is no human author of the work, the CPDA fictionalises an author to give copyright protection[22]. According to section 9(3) the author is to be taken to be the person by whom the arrangements necessary for the creation of the work are undertaken. Who might be considered to undertake «arrangements» which are «necessary» to produce a work is a controversial matter[23]. There are various possibilities[24]: programmer, user, owner of the software or hardware[25].

The article uses the same language as that used for the «producer» in determining the author of a sound recording or a film[26]. As per section 178, «producer» in relation to a sound recording or a film, means the person by whom the arrangements necessary for making the sound recording or film are undertaken. Turning to section 9(3), it seems that it includes the person who operates the computer, the programmer[27]. Nonetheless, this view does not eliminate all the ambiguity of this provision entirely. As Guadamuz demonstrates, there will be occasions where the person who made the arrangements might not be the programmer but the user instead[28]. Just think of the case of avatars or new features created by a user of an embedded video game with a high degree of AI. To attribute the copyright always to the programmer seems to run counter to logic. Otherwise, we would have to agree that the programmer would be the rightful owner of all the works generated by the AI system. This said, we must acknowledge that when a user obtains a computer program capable of producing computer-generated works and subsequently uses it to create new AI works, the ownership shall be attributed to the user[29-30].

According to section 12(7), computer-generated literary, dramatic, musical, and artistic works are entitled merely to a 50-year period of protection from

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[19] Yu (2017), pp. 1245 and 1247; Oliveira Ascensão (2008), pp. 75-76; Vieira (2001), pp. 113, 118 et seq.; Fernández Carballo-Calero (2021), p. 64 et seq.

[20] McCutcheon (2013b), pp. 915, 929 et seq.; Bainbridge (1993), p. 68; Dreier (1993), pp. 31 and 60.

[21] Gervais (1991), pp. 634 et seq.

[22] McCutcheon (2013b), p. 959.

[23] A «multi-player model» as described by Yanisky-Ravid (2017), pp. 659 and 691.

[24] McCutcheon (2013b), pp. 959 and 960.

[25] This may be applied to works such as, for example, smart or humanoid robots.

[26] Caddick / Davies / Harbottle (2017), pp. 4-25.

[27] In this regard, *vid*. Bentley / Sherman (2009), p. 122.

[28] Guadamuz (2017b), p. 176.

[29] Turner (2019), p. 126, expands the discussion by stating that the person who «made the arrangements» could be the person who built the system, the person who trained it or the person who fed it these specific inputs.

[30] The legal case *Nova Productions Ltd. v Mazooma Games Ltd*., [2006] RPC 379 seemed to refuse authorship to a user. To *vid*. a comment on this case, *vid*. Ramalho (2017), pp. 11 and 12; McCutcheon (2013b), pp. 960 and 961; Bainbridge (2007), pp. 92 and 93. However, considering the limitation of the facts of the case, it did not resolve the question of whether we should consider the software programmer(s) to be the owner of the product or even an investor or, eventually, to assign the authorship to more than one individual.

the end of the year in which the work was produced. Thus, instead of from the date of creation, the term of copyright duration is computed from the date of production of the work. Consequently, as with other special categories of works, such as works of unknown authorship[31], the general rule does not apply to computer-generated works, due to the fact that they do not have a human author[32]. Logically, this circumstance also has the effect that no moral rights are attributed to the *author* of computer-generated works. Since these works do not fall within the provisions of the 1886 Berne Convention for the Protection of Literary and Artistic Works, these specific provisions do not pose a problem in terms of international protection[33].

Having outlined the main points of the United Kingdom's legal framework, it is essential to see whether these provisions might constitute a useful model for the protection of works generated by AI in the European Union. We will address this question in the following section.

III. THE HUMAN-CENTRED CONCEPT OF ORIGINALITY IN EUROPEAN COPYRIGHT LAW: NATIONAL EXPERIENCES AND THE EUROPEAN COURT JURISPRUDENCE

It has long been understood that the definition of originality has been problematic for scholars and the courts throughout European Union countries. There is unanimity over the necessity of this requirement. However, some countries do not mention expressly the same, preferring to state that works must constitute *intellectual creations* or that the same entail some degree of *creativity*. This is the case, for example, in Portugal where the Code of Copyright and Related Rights (*Código dos Direitos de Autor e dos Direitos Conexos*) mentions, not exhaustively, which works are considered to be *intellectual creations*. Besides that, there is an extensive discussion over the legal scope and definition of originality. It is thus not a surprise that some scholars define this discussion as an «intoxicating topic»[34].

Throughout the years, scholars and the courts have formulated different definitions and judgments for *originality* which differ substantially and have resulted in a high degree of legal uncertainty[35]. The difficulties derive from a variety of reasons: (i) polysemy and different interpretation of the legal concepts used («work», «originality», «creativity», «unique», «author's personality», «author's creation», etc.); (ii) the (blurred) harmonization carried out by the European Union; or (iii) the technological evolution of society which leads to new forms of intangible assets hardly corresponding to previous concepts of originality. However, the primary source of this issue is definitely due to the different approaches by two legal traditions. They have different conceptions of how to protect works by intellectual property rights: in the *droit d'auteur* tradition, a work is protected if it incorporates the personality of its author;

[31] CDPA 1988 s. 12(3).

[32] McCutcheon (2013a), pp. 46 and 71, says that this can be a problem considering that «this may impose a higher evidentiary burden, since the creation date is usually less clear than the date of death».

[33] In the same sense: Bentley / Sherman (2009), p. 245, footnote 34.

[34] Rosati (2013), *xiii*, when presenting the acknowledgements of her work.

[35] For a common law approach, *vid*. Bentley / Sherman (2009), pp. 93 et seq.; for a civil law view, *vid*. Rocha (2008), p. 733. For a comparative look and pro-integrated view, *vid*. Rosati (2013), pp. 208 et seq.

differently, the *copyright* tradition tends to emphasize the economic aspects of copyright («right to copy»). Without an international definition it is not surprising that these two main conceptions have carved out their own understanding of *originality*.

The definition of originality of the *droit d'Auteur* tradition was first developed by French legal theorists, specifically by Henri Desbois[36], who introduced the idea of the inclusion of the author's personality into the concept of originality. This subjective view suggested, *ab initio*, that we are faced with a strict requirement: it is not enough to prove that a work comes from the author. It is also necessary to verify that the work reflects the creator's personality[37].

However, in the *praxis* the understanding has been different. Protection has been granted to *minor* and *utilitarian* works, in which the personality of the creator is hardly ascertainable. The protection of works of this kind, which the doctrine calls «petite monnaie» or «Kleine Münze», has led to a more tailored approach to the concept of originality, stating that the level of the creator's personality required is minimal[38]. It must be present in each work, but a specific amount is not required.

Within the civil law tradition, the German doctrine has also made a relevant contribution to this discussion, challenging the French understanding. Despite some terminological discrepancies, the German doctrine has advocated two separate requirements for an original work: *individuality*[39] and a *level of creativity* (*Gestaltungshöhe* or *Schöpfungshöhe*)[40]. This requirement was developed to establish the threshold between the protection of works by copyright and industrial designs[41], but was incorporated within the meaning of § 2(2), of the *Urheberrechtsgesetz*. This last requirement had significant effect in the courts. In the well-known the *Inkasso Programm* case[42] the German Federal Court of Justice (*Bundesgerichtshof*), although making clear that software is protectible under copyright law, did set a high standard for originality, refusing protection for a computer program because it lacked sufficient creativity[43]. Nevertheless, the case law has changed its view and the requirement of *Gestaltungshöhe* was abandoned by both courts and doctrine. This change was also manifest in Directive 91/250/EEC of 14 May 1991 on the legal protection of computer programs and Directive 96/9/EC of 11 March 1996 on the legal protection of databases, which rendered inoperable the position adopted by the *Bundesgerichtshof*[44]. According to article 1(3), of Council Directive 91/250/EEC of 14 May 1991 on the legal protection of computer programs, «a computer program shall be protected if it is original in the sense that it is the author's own intellectual creation. *No other criteria shall be applied* to determine its eligibility for protection». (emphasis added). Also, as per article3(1), of Directive 96/9/EC of the European Parliament and of the Council of 11 March 1996 on the legal protection of

[36] Desbois (1978), pp. 6 et seq.
[37] Vivant / Bruguière (2015), pp. 262 et seq.; Lucas / Lucas / Lucas-Schloetter (2012), pp. 117 et seq.
[38] Lucas / Lucas / Lucas-Schloetter (2012), pp. 72 et seq.
[39] It means individual expression of the author as a person.
[40] Schricker (1995), pp. 41 and 42.
[41] *Ibid*., p. 42.
[42] BGH 09.05.1985 I ZR 52/83 «Inkasso-Programm», *GRUR*, 1985, 1041.
[43] This decision was severely criticized. *Vid*., for example, Haberstumpf (1986), p. 222.
[44] Lehmann (1991), p. 2112; Lehmann / Spindler (2021), Rn. 39 and 40.

databases, «in accordance with this Directive, databases which, by reason of the selection or arrangement of their contents, constitute the author's own intellectual creation shall be protected as such by copyright. *No other criteria shall be applied* to determine their eligibility for that protection» (emphasis added)[45].

Within the copyright tradition, the primary understanding of originality is informed by a completely different sense from how it was perceived in the *droit d'auteur* tradition. We may take as an example the paradigmatic British legal system. Contrary to the majority of countries catalogued as belonging to the Civil Law tradition, and despite not providing a definition, section 1(1)(a) of the CDPA 1988 stipulates that literary, dramatic, musical or artistic works are only protected if they are «original». As in the civil law tradition, the British legal system «is concerned with the relationship between an author or creator and the work»[46]. However, scholars and the courts have not related this concept to an author's creativity. What is important is to ensure that a work is not a copy of an earlier work. Thus, the work must originate from the author, however, the requirement of «intellectual creation» is replaced by a specific requirement of a degree of *labour*, *skill*, or *effort* in producing the work[47]. There is a need to assess what the amount of input from the author to the work was, namely a «certain minimum standard of effort»[48] (*sweat of the brow doctrine*). Considering this, works produced involving «little labour»[49] will be excluded from protection, considering that they are only «trivial works»[50]. This conception of originality seemed to take the protection of works too far. A low standard of effort leads to considering simple works as a «piece of historical writing»[51] or «a news report»[52] to be protected by copyright. At the end of the day, the motto «what is worth copying is prima facie worth protecting»[53-54] applies.

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[45] As was stated by Schricker (1995), p. 46: «Computer programs, photographic works, databases - the copyright concept of a work is gradually being harmonized from the outer borders and thus removed from the criterion of the level of creativity. It is hard to imagine that this process will be discontinued. The principle of equal treatment of all categories of works in copyright law would appear to contradict the idea that higher barriers could be erected for individual kinds of work. Where such generous protection is granted in marginal regions of copyright, it will be impossible to be more pernickety in the focal areas of the arts and literature. It remains to be seen whether individuality or originality will constitute the primary criterion; however, no room will remain for a "level of creativity"».

[46] Bentley / Sherman (2009), p. 93.

[47] Cornish / Llewelyn / Aplin (2010), p. 441; Bentley / Sherman (2009), p. 93. This requisite is not used precisely by courts and scholars. Other forms of words as «skill, judgement and labour», «selection, judgment and experience» or «labour, skill and capital» can also be seen (Bentley / Sherman notices use by the courts of other words such as «industry», «time», knowledge», «taste», ingenuity», experience» or «investment» (95).

[48] Cornish / Llewelyn / Aplin (2010), p. 441.

[49] Bentley / Sherman (2009), p. 94.

[50] *Ibid*., p. 94.

[51] Cornish / Llewelyn / Aplin (2010), p. 447.

[52] *Ibid*.

[53] Strowel (1993), p. 463.

[54] Both systems have been converging in recent decades [*vid*. Silva (2017), p. 208; Vallès (2009), pp. 102 and 113]. Some authors state that there is now a «modern approach», which proceeded from «an admixture or, even, from a symbiosis of its predecessors» [Gervais (1991), p. 638]. This approach always requires the presence of a creator and effort, but not his personality, which is barely visible in the majority of the current works.

In our opinion a convergence between the two main views can be seen. Loosening of the originality concept in the major continental copyright jurisdictions and the convergence demanded by the law of the European Union contribute to this outcome. Despite the changes seen in the copyright system's definition of originality, we admit that the actual approach is much more pragmatic than it was and, in view of this, it is much closer to the original British idea of originality. Suffice it to say that taking into account the primary subjective view of originality established by French doctrine, protection of computer programs and databases would be unlikely since it would be impossible to ascertain the personality of the author (Some legislations still retain this «trail of

That said, despite the differences between the systems, we must point out that the requirement of originality has never dismissed the role of the human effort in producing a work, although it is subject to a low standard. Apart from that, certain European legal orders state even that the author of a work shall be a natural person. This is the case of the Spanish copyright legal framework (*Ley de Propiedad Intelectual*), which in article 5(1) stipulates that the author is the *natural person* who creates a literary, artistic or scientific work («Se considera autor a la *persona natural* que crea alguna obra literaria, artística o científica»)[55]. This understanding has also been adopted in other continental law jurisdictions, where the mention of an «intellectual creation» is understood as a way of implicitly requiring that works result from human work, excluding other forms of expression, such as those resulting from computers or animals[56].

We can also note this same understanding from the standard established by the European Court of Justice (ECJ). Various decisions[57] have affirmed this assumption, stating that a work must be the outcome of free and creative choices[58], where the author «can stamp the work created with his «personal touch»[59]. As stated in the CJEU *Football Dataco* case, there are no freedoms and creative choices when the creation of a work «is dictated by technical considerations, rules or constraints which leave no room for creative freedom»[60].

Actually, in terms of the European legal framework it can be seen that the option to protect computer-generated works has always been rejected. In April 1989, the European Commission published a proposal for a Directive harmonization on the legal protection of computer programmes and, following the British experience, there was special ownership provision included for computer-generated works[61]. However, this proposal was not accepted in the final version of the document. This tendency has continued over the years, as all the successive legal instruments from the European Union require that a work shall come from an author's own intellectual creation as we saw in the Directives 91/250/EEC of 14 May 1991 on the legal protection of computer programs and

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mistrust» against the Copyright protection of computer programs and databases. This is the case in Portuguese legislation, which has chosen to transpose the Directive on the Legal Protection of Computer Programs outside the Portuguese Copyright Code. Moreover, Art. 1(2), of the Legal Protection of Computer Programs (*Decreto-Lei n.° 252/94 de 20 de Outubro*) stipulates, expressly, that the protection of computer programs is analogous («protecção análoga») to the protection conferred to literary works. This has led scholars to state that protection is only equivalent since software is not an intellectual creation subject to copyright (Silva (2017), pp. 172 and 173 and Cordeiro (1994), pp. 712, 713 and 714). In this sense it is not a surprise to see courts and doctrine adopting, more and more, an objective conception of originality, which approximates the judgment made when industrial property rights are involved [*vid*. Bercovitz Rodríguez-Cano (2015), p. 53].

[55] Fernández Carballo-Calero (2021), p. 78.

[56] In this sense, in Portugal, *vid*. Vieira (2020), pp. 77 and 701; Leitão (2020), p. 69. Also in Germany, *vid*. *BeckOK UrhR/Ahlberg*, 30th ed. 20.4.2018, UrhG § 2 Rn. 55 and *BeckOK UrhR/Stollwerck*, 30. Ed. 15.1.2021, UrhG Europäisches Urheberrecht Rn. 149.

[57] *Vid*. Judgement of 16 July 2009, *Infopaq International*, C-5/08, EU:C:2009:465, § 37; Judgement of 22 December 2010, *Bezpečnostní softwarová asociace*, C-393/09, EU:C:2010:816, § 45 and 46; Judgement of 1 December 2011, *Painer*, C-145/10, EU:C:2011:798, § 87; Judgement of 1 March 2012, *Football Dataco*, C-604/10, EU:C:2012:115, § 37.

[58] *Football Dataco*, cit., § 38. The Court states as follows: «as regards the setting up of a database, that criterion of originality is satisfied when, through the selection or arrangement of the data which it contains, its author expresses his creative ability in an original manner by making *free and creative choices*» (emphasis added).

[59] *Painer*, cit., § 92.

[60] *Football Dataco*, cit., § 39.

[61] *Vid*. Article 2(5), of the Proposal for a Council Directive on the legal protection of computer programs (COM(88) 816 final).

96/9/EC of 11 March 1996 on the legal protection of databases. It can be understood thus that the European legislators never intended to introduce the possibility of protecting works generated without any human input. As it states in Recital 16 of the Directive 2006/116/EC of the European Parliament and of the Council of 12 December 2006 on the term of protection of copyright and certain related rights (codified version), the concept of the «author's own intellectual creation» should reflect «his personality» and «no other criteria such as merit or purpose being taken into account».

From this discussion we can thus point out two straightforward premises. On the one hand, the European Union human centric approach to copyright does not embrace protection for works generated by AI. It then seems «inescapable to conclude that not only does the author need to be human; the copyright work must reflect the author's personality»[62]. In the same vein, goes to the European Parliament Resolution on intellectual property rights for the development of AI technologies which considers «that works autonomously produced by artificial agents and robots might not be eligible for copyright protection, in order to observe the principle of originality, which is linked to a natural person, and since the concept of "intellectual creation" addresses the author's personality»[63]. On the other hand, given the low degree of originality required, as technology develops, it is expected that this requirement will again be challenged, namely through the efforts on the part of the various agents interacting with AI systems to prove that in a work created by AI there is still a human input. We might then see a redefinition of the concept of originality in order to make it compatible with (new) technological advances. In fact, it is impossible to ignore all the contributions made by those who deal with AI technology. For example, The *Next Rembrandt* is a result of choices made by human beings, namely the data gathering and selection that are input into the AI system[64]. And, in this respect, we can draw a parallel with the *Infopaq* case. It is not the data itself which should be protected by copyright —in the *Infopaq* case the court referred to the words themselves— but rather the «choice, sequence and combination of those» data «that the author may express his creativity in an original manner and achieve a result which is an intellectual creation»[65]. The question then is whether this human interaction with AI systems will be considered to be legally relevant and that this interaction will constitute an *intellectual creation*. As things currently stands, the concept of originality might scarcely accommodate this kind of works. As it is stated by Ahlberg it is not «sufficient for copyright protection that the human being controls the machine but can no longer influence the direct implementation process within and by the machine»[66]. Nonetheless, due the increasing importance of AI works it will be up to the ECJ to address this issue.

Further, on a practical level, we can predict another relevant consequence. As we know, for a work to be protected by copyright, no formality is required.

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[62] Guadamuz (2017b), p. 178. Also, with this conclusion: Pereira (2021), pp. 25 and 37.

[63] European Parliament, *Resolution on intellectual property rights for the development of artificial intelligence technologies*, § 15.

[64] To look into the process, *vid. https://www.youtube.com/watch?v=IuygOYZ1Ngo&t=30s*.

[65] *Infopaq International*, cit., 45.

[66] BeckOK UrhR/Ahlberg, 30. Ed. 20.4.2018, UrhG § 2 Rn. 55. We translated into English the following sentence: «Es reicht also für den Urheberrechtsschutz nicht aus, dass der Mensch zwar die Maschine beherrscht, den unmittelbaren Umsetzungsprozess innerhalb und durch die Maschine aber nicht mehr beeinflussen kann».

The mere act of creating is sufficient, thus there is no assessment as to whether the work meets the requirements for copyright protection or if it should be in the public domain. In fact, if the work generated by AI is of commercial interest, the person who contributed to its generation —usually the programmer or the company for which the programmer works— will exercise their legal position as the alleged holder of a monopoly right, monetising the work and prohibiting third parties from using it without their consent. This circumstance thus determines that, in the last instance, the assessment of AI-generated works will fall to the courts. The situation will be even more complicated if we consider that in some European countries, judges look at the work itself and not at who created it[67]. In other words, they tend to look objectively at the originality thus creating a kind of *presumption of human authorship*. In these cases, any defendant who will have the burden of proving that the work was generated without any human contribution will be caught in a catch-22 scenario, in essence one that is a *probatio diabolica*.

We must, therefore, conclude that current European standards for copyright protection do not at all allow for a solution similar to that applied in the UK, and which, although being an exception, is provided for in other countries, such as Hong Kong[68], India[69], Ireland[70], or New Zealand[71]. However, even if a similar solution is adopted by the European Union, the originality requirement will still raise complicated resolution issues. The concept of originality, even in computer-generated works, still relies on human intervention in order to attribute ownership and as Lionel Bently and Brad Sherman states «it is difficult to see how the existing criterion of originality, which focuses on the relationship between the author and the work, can be applied to computer-generated works, which, by definition, have no readily identifiable author»[72]. The paradox of this solution is quite obvious: how can the courts apply an originality test in a case where there is no human input in the creation of the work?

In an attempt to find a solution to this problem, various *originality tests* have been proposed[73], such as: (i) verify that the work has been produced by independent acts of the computer, that is, to ascertain if the work was «not copied;» (ii) objectively assess whether the computer-generated work is different from previous works; or (iii) oblige the courts to undertake a prognosis and fictional judgment[74],

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[67] *Vid*. Gompel (2014), p. 128, referring to the practice in Netherlands. The author states as follows: «In practice, however, the courts —especially those adjudicating cases at first instance and in summary proceedings— tend to disregard who actually created the work. Instead of looking at the work and the process that led to its creation to ascertain which creative choices have been made by the author, they ask themselves the theoretical question whether it is conceivable that two or more authors, independently from each other, create exactly the same work. If they consider this to be (nearly) impossible, then they typically assume that the work satisfies the originality test (*Eek BV v. Esfera*, 2007). Otherwise, they will accept that the work lacks originality and deny protection to it (*Social Deal v. Wowdeal*, 2012). In such rulings, the courts clearly overlook the actual author in assessing whether a work is the author's own intellectual creation».

[68] *Vid*. section 198 Hong Kong Copyright Ordinance.

[69] *Vid*. section 2(d)(vi) India Copyright Act 1957.

[70] *Vid*. section 2(1) Irish Copyright and Related Right Act 2000.

[71] *Vid*. section 2 New Zealand Copyright Act 1994.

[72] Bently / Sherman (2009), p. 107. Indicating this same problem, *vid*. Caddick / Davies / Harbottle (2017), pp. 3-273.

[73] McCutcheon (2013a), p. 51; Bently / Sherman (2009), p. 107.

[74] *Vid*. Bently / Sherman (2009), p. 107: «if the same work had been generated by a human author would it have required the exercise of a substantial amount of skill, labour, and effort? If yes, then the computer-generated work would be original».

assessing if the computer-generated work would require a substantial amount of *skill*, *labour* and *effort* if it had been produced by a human.

It is difficult to justify some of these criteria. We have seen that originality is not only a problem of not copying an earlier work. Even in an objectivist view there is always a minimal level of creativity required. For example, as for the last proposed originality test, it seems unreasonable and, even impossible, to undertake a fictional judgment of a human activity, considering that the work was created by a machine. Further, many works produced by AI are already very complex and based on sophisticated algorithms so the creative activities undertaken are not and would not be attainable by the human brain. In this sense we must ask ourselves how a judge could possibly undertake a fictional judgment when the many IA generated works could not be produced at all by a human.

Having analysed the possibility of protecting works generated by AI under European copyright law, we must now examine the possible protection by related rights, namely by related rights. That will be the focus of our in the next point.

IV. THE PROTECTION OF AI WORKS THROUGH THE RELATED RIGHT OF PRODUCERS OF SOUND RECORDINGS

As we pointed out in the previous section that, in principle, given the requirement of a human contribution, works created by AI will not be protected by the European copyright law and remain in the public domain. However, it should be ascertained whether AI works may be protected by related rights. As we know, related rights are rights analogous to copyright (here, in the sense of authorial works and not a copyright in the broad sense) which includes the protection of different *expressive objects*[75] such as the performance of literary or artistic works, the production of phonograms (recording of sounds) or broadcast transmissions.

As a sound recording, AI-generated works may be protected by the rights of the phonogram producer. In article 3(b) of the International Convention for the Protection of Performers, Producers of Phonograms and Broadcasting Organizations (Rome Convention), a phonogram «means any exclusively aural fixation of sounds of a performance or of other sounds». No further requirements are added. What is protected is the technological and economic investment in recording the sound[76] and not the work recorded itself.

In this sense, phonogram protection may include both copyright protected works and works that have been protected but are now in the public domain, as well as works that have never been protected by copyright. Since there is no requirement that the sounds to be protected must derive from an *intellectual creation* (which includes sounds of nature, such as bird-songs[77] or other kind of *natural* noises), it is perfectly possible that AI-generated works, even if they have never been protected, may be subject to be recorded and thus be protected by this related right. This premise can be drawn from Article 1 of the Rome

[75] Pila (2017), p. 143.
[76] *BeckOK UrhR/Stang*, (2020), UrhG § 85 Rn. 1.
[77] Cornish / Llewelyn / Aplin (2010), pp. 11-26. Also *vid*. Pollaud-Dulian (2014), p. 1608.

Convention, which states «protection granted under this Convention shall leave intact and shall in no way affect the protection of copyright in literary and artistic works. Consequently, no provision of this Convention may be interpreted as prejudicing such protection». This provision works in two ways: on the one hand, the copyright protection of the work does not affect the related rights protection, and, on the other hand, the related right protection of the performance does not affect the possible copyright protection. There is, thus, independence of protection, from which we can conclude that the protection by related rights protects works even if they are not protected by copyright. In fact, it is important to mention that the protection of AI-generated works cannot be excluded by this related right, by arguing that there is no *creative expression*. The lack of copyright protection for this type of work is not related to the absence of creative expression. From the expressive point of view, there may be a complete similarity between the expression created by an AI agent (or, in another perspective, even by an animal) and a human being[78]. The denial of protection, as we have seen, steams from the requirement of (human) *intellectual creation*.

Further, nothing precludes this protection from being granted to a legal person. According to article 3(c), of the Rome Convention, the *producer of phonograms* «means the person who, or the legal entity which, first fixes the sounds of a performance or other sounds». Producers have the right to authorize the reproduction, distribution, and communication to the public of their sound recordings[79].

However, even if this protection is possible, we must not forget that it is distinct from that enjoyed by works protected as *authorial works*. In addition to having a purely patrimonial content, leaving out moral rights, protection is limited to a shorter period of time (in general, 50 years from the date of the fixation or the performance)[80]. Additionally, unlike a copyright, it is subject to a mandatory formality[81], namely it must bear a visible a notice consisting of the symbol (P), that is a capital P within a circle, in all copies in commerce of the published phonogram or their containers. Finally, this *indirect protection* is, somewhat, dysfunctional. It disregards some types of works, such as literary works, photographs, or computer programs. Nevertheless, for certain AI-generated works their mere fixation will present an option to enjoy exclusive IP rights for these works.

V. A TAILORED PROTECTION FOR AI-GENERATED WORKS?

The possibility of creating a new right *lege ferenda*, such as a related or *sui generis* right for AI-generated works has been discussed in the literature[82]. This appears to be the approach chosen by the previously mentioned EP Report from 2017, which, in its explanatory statement, calls for «the elaboration of criteria for "own intellectual creation" for copyrightable works produced by computers or robots»[83]. The rationale is the same for the protection of some related rights

[78] VIEIRA (2020), pp. 700 and 701.

[79] *Vid*., for example, Article 184(1) of the Portuguese Code of Copyright and Related Rights.

[80] *Vid*. Article 3(2), of the Directive 2006/116/EC of the European Parliament and of the Council of 12 December 2006 on the term of protection of copyright and certain related rights.

[81] *Vid*. Article 11, of the Rome Convention.

[82] *Vid*., for example, LAUBER-RÖNSBERG / HETMANK (2019), pp. 641 and 646.

[83] *Vid*. footnote 10. *Vid*., also, FERNÁNDEZ CARBALLO-CALERO (2021), pp. 106 et seq.

(for instance, the protection for producers or broadcasters) or the makers of databases: the protection of the investment.

Ana Ramalho[84] advocates that the legislators should consider a public domain model for AI-generated works. In this sense, the author proposes an approach based on a *disseminator's right* provided for in article 4 of the Term of Protection Directive. This provision states that any person who, after the expiration of copyright protection, for the first time lawfully publishes or lawfully communicates to the public a previously unpublished work, shall benefit from protection equivalent to the economic rights of the author. The term of protection of such rights is 25 years from the time when the work was first lawfully published or communicated to the public. Given the current copyright laws and practices, this solution seems unlikely to apply to of AI-generated works. First of all, this regime only covers unpublished works, that is, works that have entered the public domain without being disseminated. The subsequent lawful divulgation of a work will give the disseminator not a copyright standard of protection, but a kind of atypical exploitation right with a duration of 25 years. In the case of AI-generated works, with the absence of any human authorship, they are in the public domain, not because the term of protection has elapsed, but because they were never protected. The underlying rationale is therefore completely different. Additionally, even if it is advocated that this legal framework also covers works that have never been protected, it seems to us that, after all, the human authorship requirement is not waived. While it is true that the legal regime's purpose is to stimulate the publication of unpublished works, it must also be noted that it is geared toward works created by human beings.

We should also point out that any solution that chooses this path will have to be subject to a thorough evaluation of the positive and negative impact that this measure may have, especially in promoting innovation and the effects of creating this new legal monopoly[85]. This view is closely linked to the way we look at rights over immaterial goods such as copyright and related rights. Rights over immaterial goods should be granted only to the extent required by the public interest. In this sense, freedom remains the principle and the right of exclusivity is the exception[86]. Any analogy between intellectual property rights and *rights in rem* must then be rejected.

As for AI technology specifically, it should be considered that a new IP right «might foster market concentration and stifle the entry of new ventures into the market, because competitors with access to AI will have huge advantages over those without»[87]. In addition, from another perspective, the creation of a related right to protect AI-generated works could have a negative effect on one of the objectives of copyright, which is to promote intellectual creation by human beings[88]. The equivalence in protection for AI generated works will be a distinct discouragement for human creation that in a short time will no longer be able to compete with AI systems, given their almost infinite production capacity. That belies the question as to whether the *freedom of cultural creation* should

[84] Ramalho (2017), pp. 19 and 20.
[85] *Ibid*. pp. 16 and 17.
[86] We follow: Vicente (2018), pp. 49 and 66.
[87] Lauber-Rönsberg / Hetmank (2019), p. 645.
[88] *Ibid*.

be left to *robots*, with works inevitably losing their subjective character - isn't this subjective character an essential element in what we call the *beauty* of art?

On the other hand, even if it can be said that AI agents do not need incentives to produce works, the same can no longer be said of humans confronted with innovation linked to AI. And here there are several intellectual property rights that compete for this protection, such as patent law, designs protection or the database *sui generis* right. The question remains whether the currently used instruments of protection are sufficient to protect AI-related innovations. Several doubts have been raised on this topic. For example, in the case of patent law since AI systems are largely based on algorithms. As they constitute mathematical methods, algorithms as such are not patentable[89]. It has been pointed out that the lack of protection may «limit innovation by dissuading developers and companies from investing in AI research, resulting not only in the decline of AI but also in the decline of innovation across a number of related sectors»[90].

In this sense, there is no denying the conduct studies on whether the proposed intellectual property rights framework is sufficient to protect AI-based innovation. However, the possible affirmative answer to this question does not mean that the *fruits* generated by AI systems should also have protection. This is the ultimate issue that remains to be proven. Nevertheless, we believe that any solution that provides for the protection of AI-generated works should not also result in abandoning the anthropocentric character of copyright. The human being must continue to be the purpose and end of this type of protection. If implemented, the proposed solution should thus include granting a related right of rather limited duration, allowing AI companies to obtain a due reward for their investment while at the same time respecting, and protecting the human element.

VI. THE REJECTION OF AN E-AUTHORSHIP/OWNERSHIP

Some scholars have proposed a radical approach regarding the *authorship/inventorship* conundrum, opening the door to attributing authorship to non-humans. According to Ryan Abbott[91] «it would encourage innovation under an incentive theory [...] although AI would not be motivated to invent by the prospect of a patent, it would motivate computer scientists to develop creative machines»[92]. Kaminski[93] develops what he calls «algorithmic authorship». According to the author, attributing copyright authorship to non-humans is not disruptive in view of the developments that have taken place in the area, which have, to some extent, already put an end to the romantic idea of human authorship, namely the fact that the degree of originality required for copyright protection is very low, as well as the *work-for-hire* doctrine. Both demonstrates that the attribution of authorship in copyright is no longer centred around the human being.

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[89] EPO, *Guidelines for Examination in the European Patent Office* available at: «https://www.epo.org/law-practice/legal-texts/html/guidelines/e/g_ii_3_3_1.htm» (accessed 11 January 2021). According to Article 52(2)(a), European Patent Convention, shall not be regarded as inventions «discoveries, scientific theories and mathematical methods».

[90] HRISTOV (2017), pp. 3, 431 and 438.

[91] ABBOTT (2016), p. 1098 et seq.

[92] *Ibid*. p. 1104.

[93] KAMINSKI (2017), p. 589.

This issue has already crossed the frontiers of theory in the field of patents. On 25 November 2019, the European Patent Office (EPO) refused two patent applications in which an AI system (called «DABUS») was designated as the inventor[94]. EPO held that the applications did not meet the conditions of the European Patent Convention (EPC) because the requirement that the inventor be a human being[95]. According to the decision, «the legislative history shows that the legislators of the EPC were in agreement that the term «inventor» refers to a natural person only» (§ 24) Further, «AI systems or machines have at present no rights because they have no legal personality comparable to natural or legal persons. Legal personality is assigned to a natural person as consequence of their human being human, and to legal person based on a legal fiction» (§ 27).

We must first understand the reasoning behind this discussion. For example, Martin Stierle, when discussing *de lege ferenda* the possibility of attributing inventorship to AI systems, presents some arguments in support of that solution, namely the reduction of uncertainty, the avoidance of false statements and inappropriate inventor's rights or the incentives to invest in AI[96]. However, the author does not support the notion of granting AI systems legal personality or entitling AI to patent ownership or moral rights.

If the justification lies solely in attributing the authorship/inventorship to the AI system, then the solution cannot be found through this amendment alone. As is the case of copyright, the attribution of exclusive rights was based on the human contribution. This is true not only for the originality concept, but also for its legal content or limits. In this sense, we refer to what was said in the previous sections. Any *ad hoc* solution that protects AI-generated works should be seriously considered and should balance its advantages and disadvantages. Any isolated amendment may present teleological and systematic paradoxes. Thus, we will not see any advantage to adopting such a solution. Moreover, even if a new IP right is created to protect this type of works, there is no need to attribute authorship to an AI agent. This solution, apart from being legally meaningless, is antagonistic to the very idea of authorship. This is the reason why, as we have seen, the UK computer-generated works regime does not assign any moral rights.

If the attribution of intellectual property rights to robots goes in the direction of appropriating personality rights to them just as they are recognised for human beings, to refute such an understanding, it will suffice to recall what we stated in the previous point: the rationale behind the attribution of exclusivity rights does not apply at all to machines. AI agents do not need incentives to generate works or to be recompensated for their «creativity efforts». Nor would this solve the question of who could transfer or license the protected works[97]. In addition, any inference of equivalence with human beings shall be refused. Apart from that, it still must be proven that AI systems will eventually match or surpass human intelligence —seen as a whole and not just in certain tasks—, a high level of

[94] It concerns the patent applications EP 18275163 and 18275174. All the information on the applications, including the associated documents, can be found through a search on *https://worldwide.espacenet.com/*.

[95] *Vid*. article 81 and Rule 19(1) EPC.

[96] *Vid*. Stierle (2021), pp. 115, 123 et seq.

[97] Lauber-Rönsberg / Hetmank (2019), p. 646.

autonomy is not synonymous with freedom[98]. Contrary to other beings, human beings have been given the opportunity to confirm their personality, within the context of freedom. An entity with complete autonomy will never be free at all, and not being free, it cannot have rights and duties. It is true that the EP Report from 2017 suggesting the creation of a centre for the attribution of legal situations for civil liability, and it proposed to create the status of electronic legal persons for the «most sophisticated autonomous robots»[99]. However, this proposal does not aim to create a status of a legal personality similar to that which exists for human beings. It only aims to create a legal status to make them liable to «any damage they may cause, and possibly applying electronic personality to cases where robots make autonomous decisions or otherwise interact with third parties independently»[100]. So, this proposal does not intend to replicate for AI the legal personality attributed to human beings, but only to create a centre of legal imputation for specific situations of civil liability, as is the paradigmatic case of damage caused by AI agents that may not be solved on the basis of classical civil law schemes.

Finally, any equivalence to the attribution of copyright protection to legal persons shall also be dismissed. The concept of authorship —which is always human— must therefore be distinguished from ownership. Even when works are originally attributed to legal persons, the requirement of human authorship is never waived. The work only receives protection if it results from a human creative effort, even if the ownership is originally attributed to a legal entity[101]. The legal person is, in reality, a legal fiction created only to satisfy human needs. It is the pursuit of the interests and purposes of human beings that justifies and legally grounds their existence. Thus, we do not see any practical or legal advantage in attributing ownership to AI systems in terms of IP.

VII. CONCLUSIONS

After the preceding analysis, we can draw the following conclusions:

1. As AI continues to advance and develop, it will imply that little or no human input is involved in creating these works. For example, paintings, novels, music compositions and other works are being generated by AI with little or no human input, so the first question is whether these works should be protected by copyright. If we look at the legal rules concerning copyright in the various European legal systems, the solution adopted in the UK for «computer-generated works» stands out. Although we have our doubts whether this legal regime has been created to deal with the new challenges posed by AI, we might agree that this provision provides an umbrella copyright protection for AI works.

2. However, due to the human-centred concept of originality this solution cannot be replicated in the European Union. Despite the differences between the systems of the various member states, the fact remains that the requirement of

[98] *Vid*., in this topic, BARBOSA (2016), pp. 1475 and 1482.

[99] EUROPEAN PARLIAMENT, *Report with recommendations to the Commission on Civil Law Rules on Robotics*, cit., § 59(f).

[100] *Ibid*.

[101] *Vid*., for example, article 19(1) of the Portuguese Code of Copyright and Related Rights, for collective works.

originality has never renounced to the necessity of human effort in producing a work, although it is subject to a low standard. We can also see this understanding from the standard established by the ECJ, where various decisions have affirmed this assumption, stating that a work must be the outcome of «free and creative choices», where the author should stamp the work created with his «personal touch». This concept may also be found in many European Directives on Copyright, where a work is protected if has originality in the sense that it is «the author's own intellectual creation».

3. Nonetheless, given the low degree of originality required, as technology evolves, it is expected that this requirement will again be challenged, namely by the attempt on the part of the various agents interacting with AI systems to prove that in the work created by AI there is still a human input. At the end of the day, «this is no different than assessing the degree of originality for purposes of protection of a fully human-produced work»[102], and «the greater the machine's role in the work's production, the more the «author» must show [how] her role in the work's production»[103]. We expect to see a redefinition of the concept of originality to integrate it with (new) technological advances. Due to the increasing importance of AI works, it will fall to the ECJ to address this issue.

4. Further, in the *praxis*, we foresee another relevant consequence. Since in European countries originality is considered objectively, thus creating this *presumption of human authorship*, we may see many disputes relating to AI-generated works which are considered, *ab initio,* to have been created by a human being. The burden of proof will then fall on the defendant, who will have to demonstrate that the work was generated without any human input, which in practice may be very difficult or even impossible.

5. Even if the future of European copyright law involves the introduction of the UK solution, some problems remain that must be taken into account. One of the main difficulties will be to assess the concept of originality for works created by a computer, difficulties which have already been documented by British literature.

6. It cannot, however, be said that AI-generated works are left without any form of copyright protection. As a sound recording, AI-generated works may be protected by the rights of the phonogram producer. A phonogram protection may include both copyright protected works and works that have been protected but are now in the public domain, as well as works that have never been protected by copyright. Since there is no requirement that sounds derive from an intellectual creation, it is perfectly possible that AI-generated works, even if they have never been protected, may be recorded, and thus be protected by this related right. Actually, it is important to mention that the protection of AI-generated works cannot be excluded by this related right, arguing that there is no *creative expression*. The lack of copyright protection for this type of works is not related to the lack of expression. From the expressive point of view, there may be a total similarity between the expression created by an AI agent and a human being. However, even if this protection is possible, we must not forget that it is distinct from that protection enjoyed by authorial works, in terms of

[102] Ramalho (2017), p. 13.
[103] Ginsburg (2003), p. 1704.

content, requirements and duration. In addition, this *indirect protection* is dysfunctional, since it fails to include some types of works such as literary works, photographs, or computer programs.

7. The possibility of creating a new right *lege ferenda*, such as related or *sui generis* right for AI-generated works has been discussed. Any solution along these lines will have to be submitted to a thorough evaluation of the positive and negative impacts that this measure may have, especially in promoting innovation and the fallout from creating this new legal monopoly. Such copyright protection should be granted only to the extent required by the public interest. Freedom remains the principle with the right of exclusivity being the exception. The question is whether the current IP protection are sufficient to protect AI-related innovations. Nonetheless, we are convinced that any solution that is passed for the protection of AI-generated works should not be instituted if it results in abandoning the anthropocentric character of copyright. The human being shall continue to be the purpose and end of this type of protection. If implemented, the solution should be a form of a tailored protection, granting a related IP right of rather limited duration, thus allowing AI companies to obtain a due reward for their investment.

8. Some authors propose a redefinition of the concept of *authorship/inventorship*, opening the door to attribute it to non-humans. It is first necessary to understand, first, the reasoning behind this discussion. If the justification lies solely in attributing the *authorship/inventorship* to the AI system, then the solution cannot be found through this amendment alone. The attribution of exclusive rights, as is the case of copyright, was founded on the human contribution. This is true not only for the originality concept, but also for its legal content or limits. Thus, any solution must involve the construction of a system that is coherent with the reality we are witnessing and avoid teleological and systematic paradoxes. Moreover, even if a new IP right is created to protect this type of works, there is no need to attribute authorship to an AI agent. This solution, apart from being meaningless from a legal point of view, is antagonistic to the very idea of authorship.

9. We should also refuse the attribution of ownership to AI agents. Any equivalence with human beings must be denied. Apart from that, it still remains to be proven that AI systems will match or surpass human intelligence - seen as a whole and not just in certain tasks. A high level of autonomy is not synonymous with freedom. Although there are some proposals for the creation of *e-persons*, these proposals do not aim to replicate the legal personality allocated to human beings, but only to create a centre of legal imputation for certain situations of civil liability, of damage caused by AI agents that cannot be solved within the classical civil law legal framework. In addition, the concept of authorship —which is always human— must therefore be distinguished from ownership. Even when works are originally attributed to legal persons, the requirement of human authorship is never waived. Thus, in terms of IP, we do not see any practical or legal advantage to attribute ownership to AI systems.

VIII. BIBLIOGRAPHY

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